



BOX Patent App

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Homan, et al.

Serial No: 09/177,902

Filed: 10/23/98

For: METHOD AND APPARATUS FOR
PACKED COLUMN SEPARATIONS
AND PURIFICATIONS

) Art Unit: 1724

) Examiner: Ivars C. Cintins

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I, Brian Dockendorff, do hereby declare and state as follows:

From about October of 1996 until about June of 1999, I served as a research assistant in the Chemistry Department at the University of Washington (UW) under the direction of Professor Ruzicka. During my time at UW, I gained significant experience working with movable, solid rod valve members as those are described in the background section of the specification of the above captioned patent application (solid rods). During this time, I helped develop a miniaturized and fully automated solid phase extraction system using solid rods and based on sequential injection. I perfected the electrical and mechanical systems as well as edited software for computer interface, and applied this system to the extraction of Theophylline from a complex solution. During my time at the University, I participated in the following presentations and publications:

UW UNDERGRADUATE RESEARCH SYMPOSIUM

Invited to give a talk and present a poster at the first annual research meeting (April 1998)

INT'L CONFERENCE ON FLOW INJECTION ANALYSIS AND
32ND SEMI-ANNUAL MEETING OF THE JAPANESE ASSOCIATION
FOR FIA

Selected by UW College of Arts and Sciences Divisional Sciences Dean to give a talk and present a poster (August 1998)

Dockendorff, B.; Holman, D. A.; Christian, G. D.; Ruzicka, J. Automated solid phase extraction of theophylline by sequential injection on renewable column. Anal. Commun. 1998, 35, 357-359.

Since June of 2000, I have been employed as a science and engineering associate at the Pacific Northwest National Laboratory (PNNL), Richland Washington. While serving in this capacity, I have participated in the development of a generic automated pathogen detection platform for use in clinical and non-clinical settings. During this project, I worked to advance chemistries, specifically PCR, SDA, bead capture and detection methodologies necessary for pathogen detection. The system includes the use and automation of a two bead capture technique, the magnetic capture cell and the rotating rod described in the above captioned US Patent Application.

The objectives of this project required that these chemistries be integrated with an easy to use electronics platform consisting of fluidic components and a microcomputer control system. This approach would be employed to carry out an automated routine designed to collect, process and detect from a sample specific pathogens without operator assistance. To that end, I assisted in designing the layout for, and helping to coordinate the building of a flexible automated Microfluidic System. Moreover, to allow for full automation, I designed and wrote *Fluidics System Software* for controlling Pumps, Valves, Detectors and Peltier PCR devices associated with these systems. As a result of this work, I have co-authored the following published manuscripts:

Bruckner-Lea CJ, Tsukuda T, Dockendorff BP, Follansbee JC, Kingsley MT, Ocampo CF, Stults JR, and Chandler DP. 2001 "Renewable Microcolumns for Automated DNA Purification and Flow-through Amplification: From Sediment Samples through PCR." *Analytica Chimica Acta* . PNNL-SA-34985, Pacific Northwest National Laboratory, Richland, WA.


Bruckner-Lea CJ, Ackerman EJ, Dockendorff BP, Holman DA, Kim J, and Grate JW. 2001 "Renewable Surface Biosensors with Optical Detection ." In *Electrochemical Society Symposium Proceedings, 2001* PNNL-SA-34650, Pacific Northwest National Laboratory, Richland, WA.

Bruckner-Lea CJ, Ackerman EJ, Dockendorff BP, Holman DA, Kim J, and Grate JW. 2001 "Renewable Surface Biosensors With Optical Detection." In *Chemical and Biological Sensors and Analytical Methods* PNNL-SA-34465, Pacific Northwest National Laboratory, Richland, WA.

As a result of my work with both types of devices, and my general familiarity with this field of technology and technological development, I can offer the following observations.

- 1) Those having ordinary skill in the art of using and building microfluidic systems were very aware of the drawbacks and disadvantages inherent in the solid rod type systems described in the background section of the specification of the above captioned patent application (solid rods).
- 2) The drawbacks and disadvantages inherent in these prior solid rod type systems created significant incentives for alternative systems that would overcome these drawbacks and disadvantages, and those having ordinary skill in the art were very aware of these incentives.
- 3) Despite the incentive for alternative systems that would overcome these drawbacks and disadvantages of these prior art solid rod systems, to my knowledge, none among those having ordinary skill in the art were able to conceive or reduce to practice any effective system for overcoming these disadvantages, until the rotating rod concept described in the above captioned patent application was conceived.
- 4) The rotating rod concept described in the above captioned patent application thus fulfilled a long felt need among those having ordinary skill in the art for alternative systems that would overcome these drawbacks and disadvantages inherent in the prior art solid rod systems.

Upon penalty of perjury, by affixing my signature below, I hereby declare that the forgoing is true on this 24th day of July, 2002.

 7-24-2002
Brian Dockendorff